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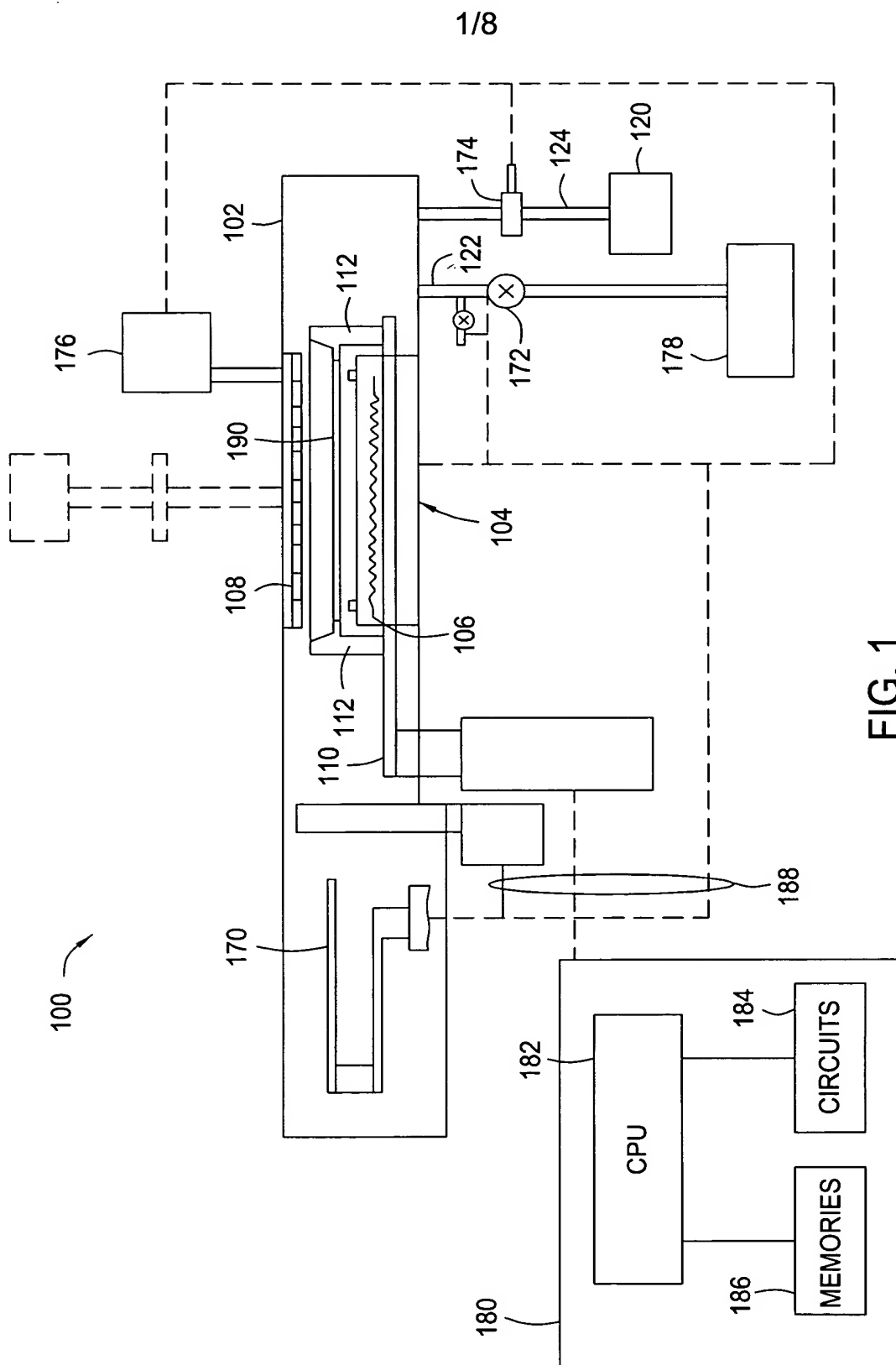
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10/611,589
JUNE 30, 2003
APPLIED MATERIALS, INC.
METHOD AND APPARATUS FOR ANNEALING COPPER FILMS
CHEN, ET AL.

CONFIRMATION: 5241

SHEET 2 OF 8

2/8

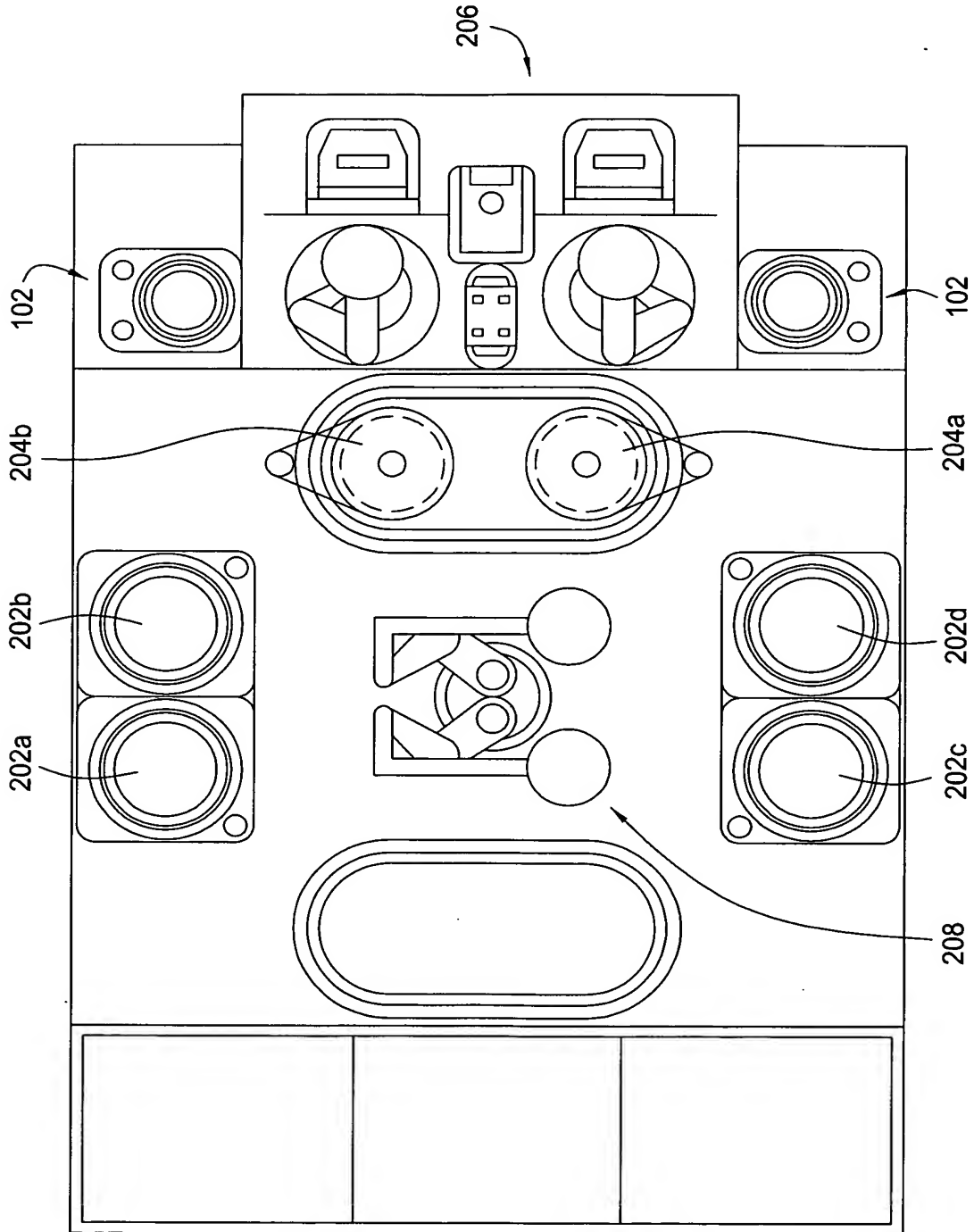


FIG. 2



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SHEET 3 OF 8

3/8

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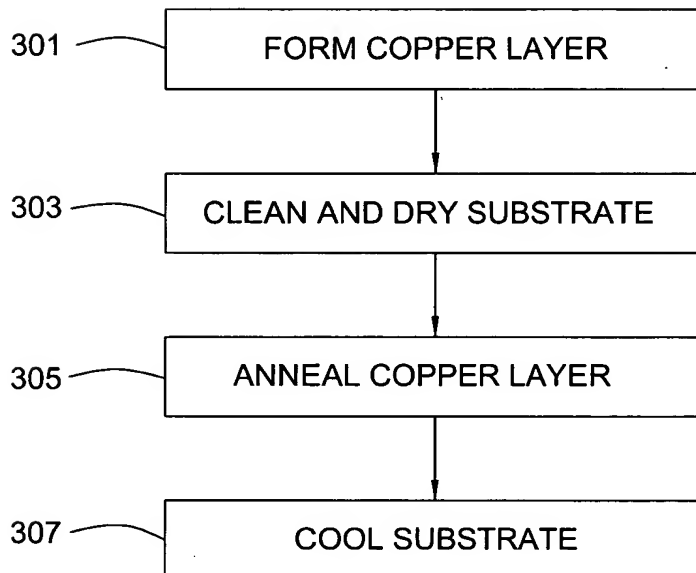


FIG. 3



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SHEET 4 OF 8

FIG. 4A

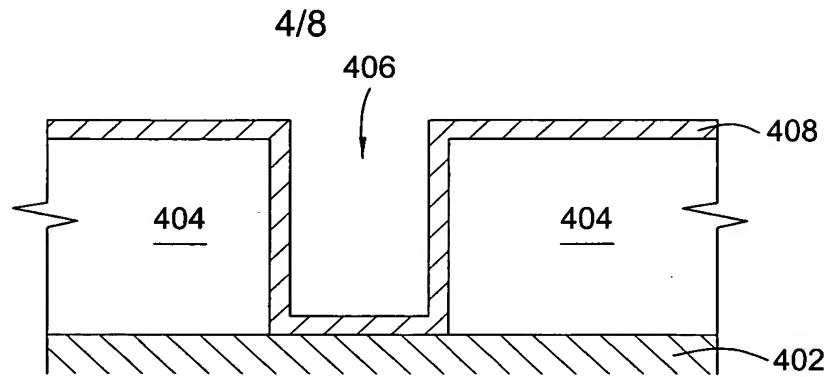
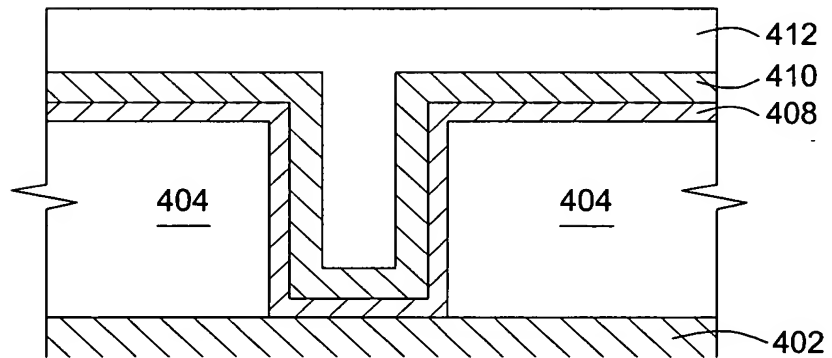
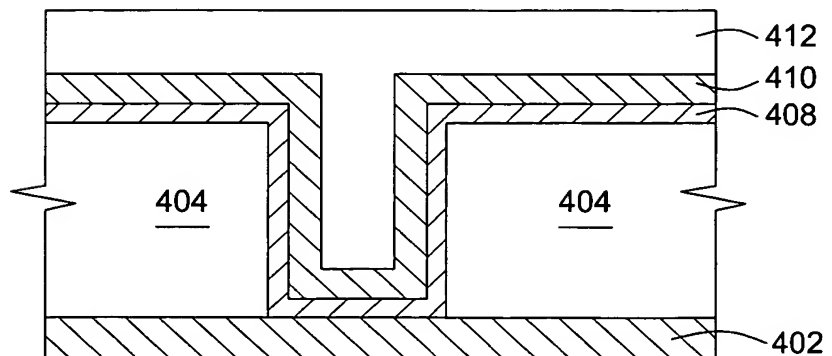


FIG. 4B



414

FIG. 4C





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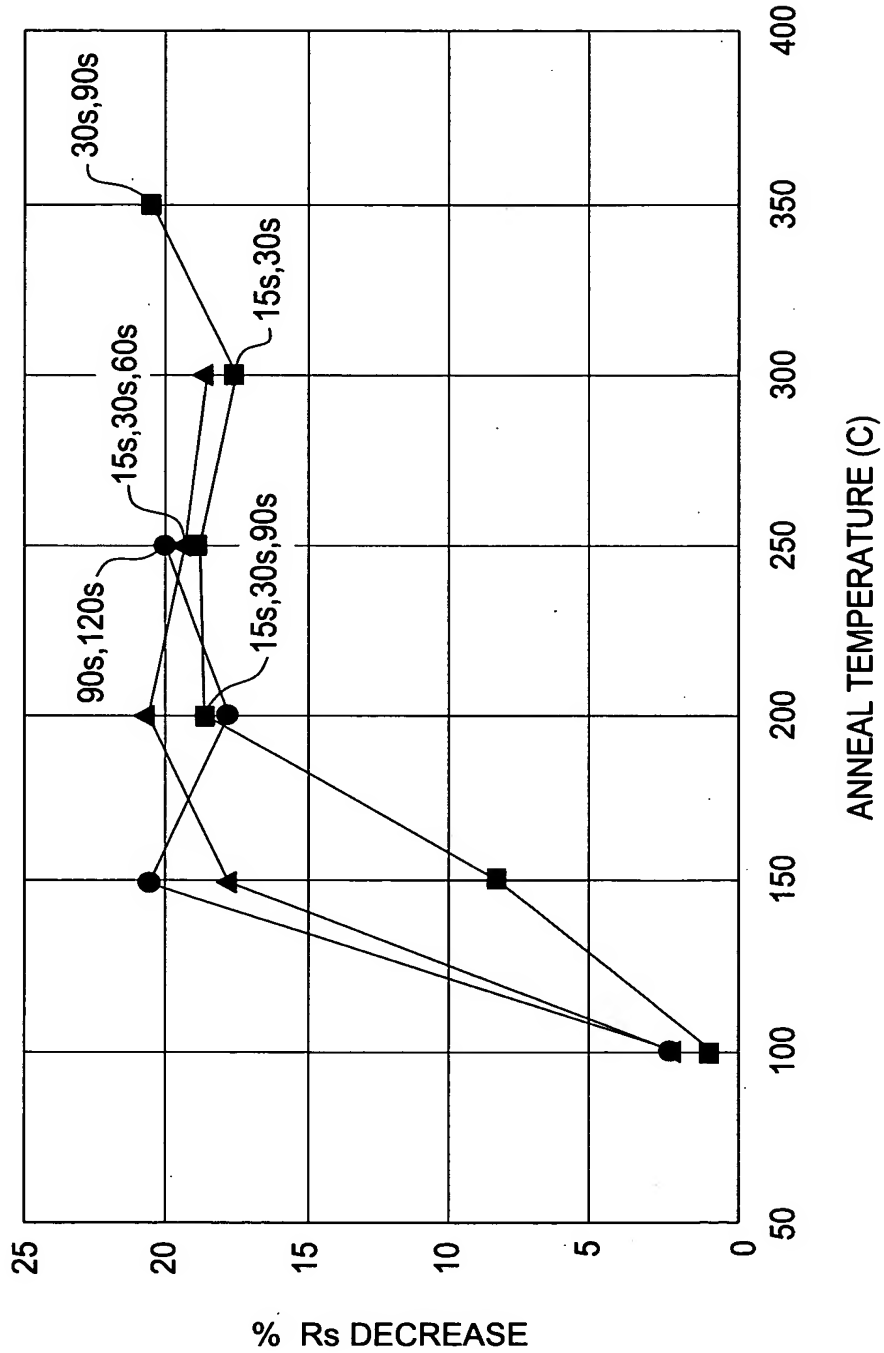
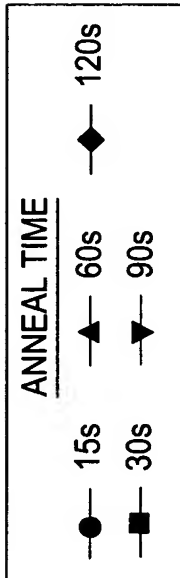
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CHEN, ET AL.

SHEET 5 OF 8

5/8

FIG. 5

FILM STACK:
10kSiO₂/250Å TaN/2kÅ IMP CU/
10kÅ ECP CU
ANNEAL IN FORMING GAS
(4%H₂ in N₂) with < 5 ppm O₂ level



PERCENT Rs CHANGE AS A FUNCTION OF ANNEALING TEMPERATURE AND TIME



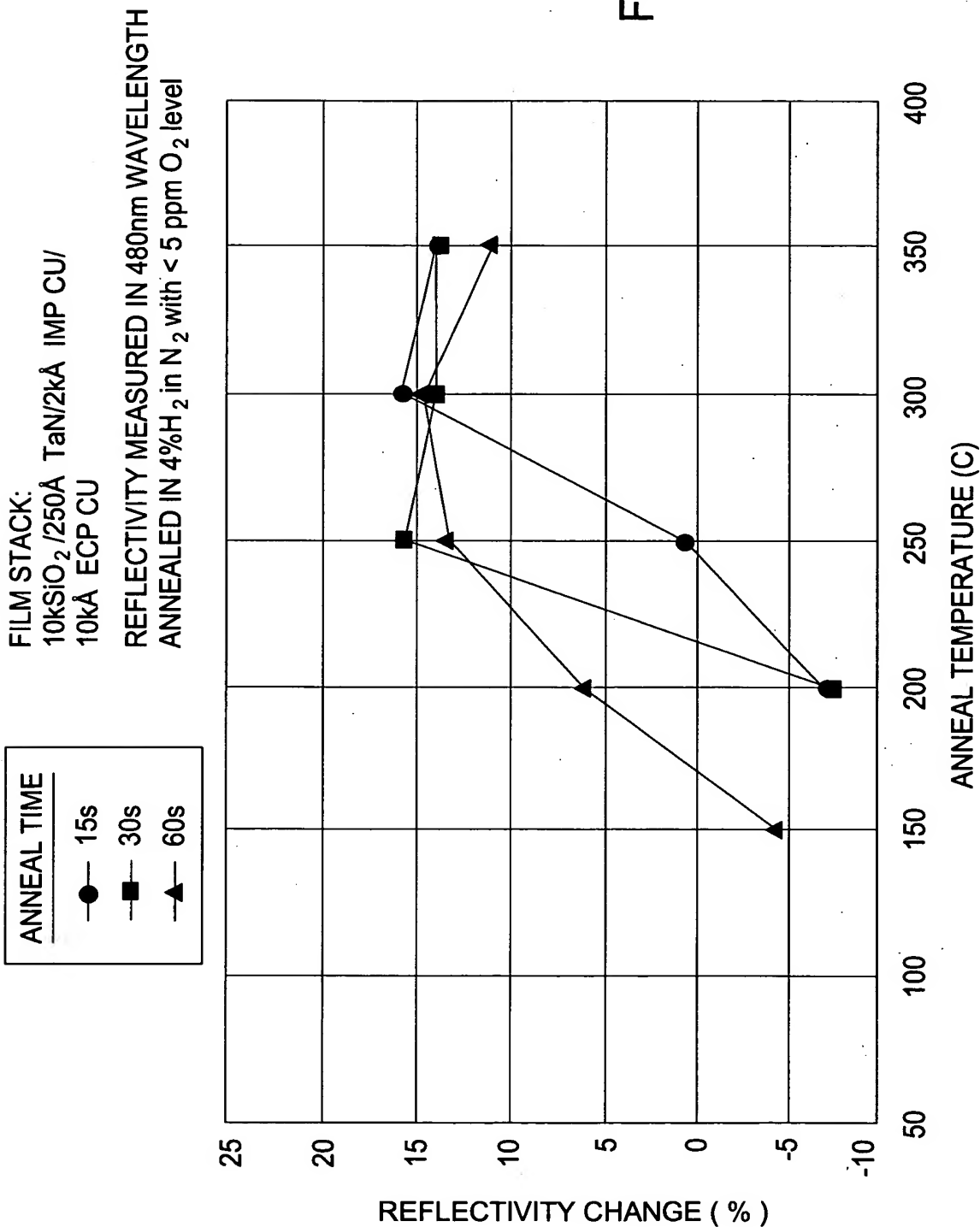
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SHEET 6 OF 8

6/8

FIG. 6



ECP COPPER FILM REFLECTIVITY CHANGE AS A FUNCTION OF ANNEALING TEMPERATURE AND TIME



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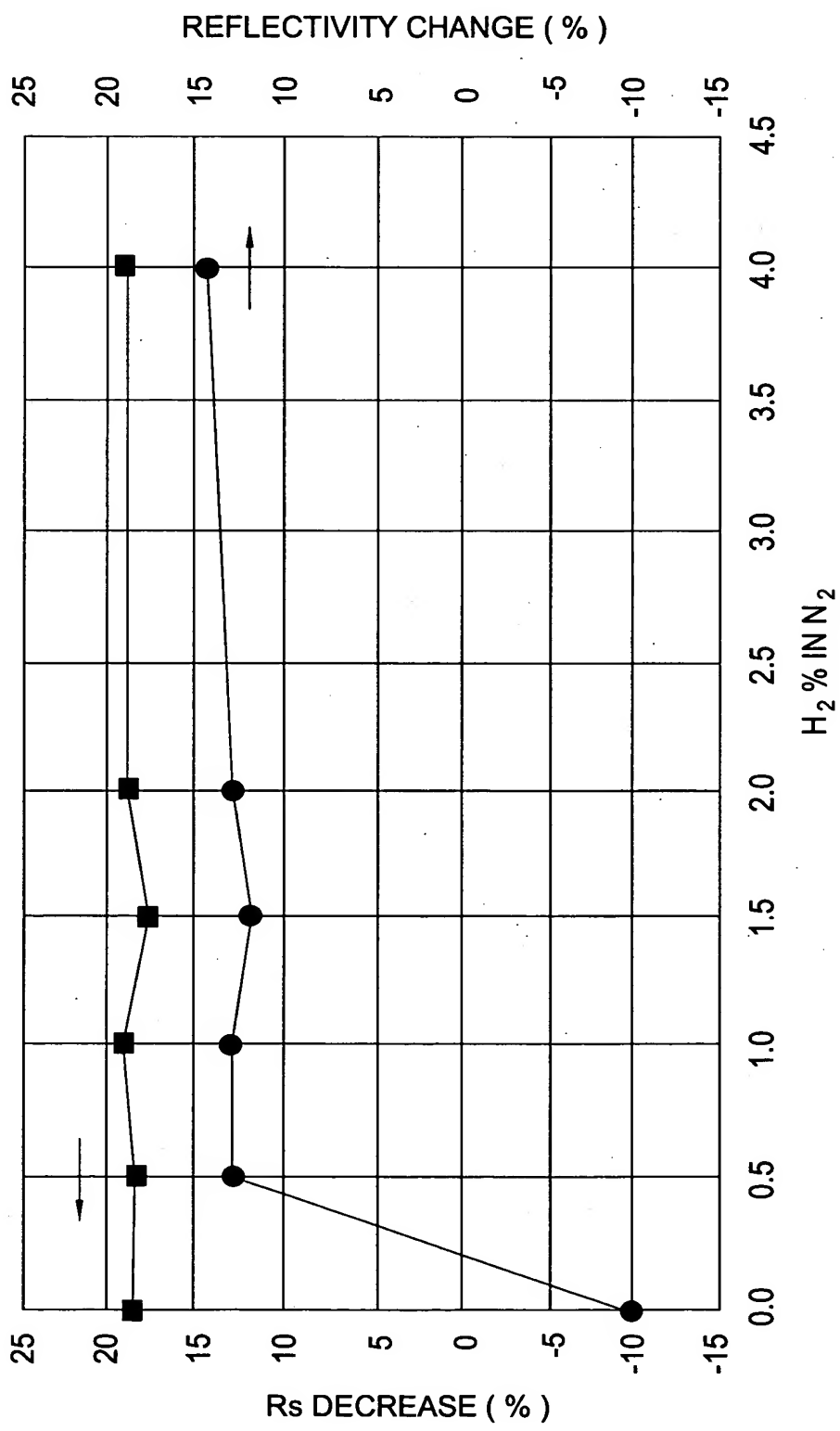
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SHEET 7 OF 8

7/8

FIG. 7

FILM STACK:
10kSiO₂/250Å TaN/2kÅ IMP CU/
10kÅ ECP CU
ANNEALED AT 300C IN <5ppm O₂ LEVEL ATMOSPHERE
REFLECTIVITY MEASURED AT 480nm WAVELENGTH



Rs DROP AND REFLECTIVITY CHANGE AS A FUNCTION OF HYDROGEN CONTENT IN CHAMBER



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SHEET 8 OF 8

8/8

